contained in the report before us :—" Attention is now called to the remarkable specimen of leaf (*I. sumatrana*) . . . yielding in the air-dried condition, on analysis by the isatin process, almost twice as much indigotin as the best specimen of Java leaf " (p. 109).

This particular specimen appears to have been grown in southern India.

It is, unfortunately, only too notorious that those whose interests have been most severely assailed by the synthetical product, viz. the planters themselves, have assumed an attitude of hostility towards these later attempts to place their industry on a scientific basis. They have been advised, as the result of independent investigations by their own experts, that their present method of manufacture leaves no room for improvement. If this be the real state of affairs, then it may safely be asserted that the days of the native industry are numbered. The case has been further complicated by a most regrettable antagonism of parties, and at one period assumed a polemical aspect most detrimental to the real cause at issue. That cause is, in brief, the survival or extinction of the Indian indigo planter. It has transpired in the course of the development of the case that the decision whether the planters have been doing themselves justice as manufacturers has been of necessity thrown back upon the accuracy of certain analytical methods. It is on this very point that there has, unhappily, been conflict of evidence, and the planters have chosen, perhaps not unnaturally, that verdict which appeared to mitigate their past neglect of the scientific side of their industry. But if they have been wrongly advised, their advisers have made themselves answerable to the Indian Government and to the Indian nation on the very serious charge of having deliberately brushed aside the one chance of re-establishing the native industry which might fairly be expected to follow from the practical development of the results now made known. There are many scientific chemists in this country who, with full knowledge of the facts of the case, are distinctly of opinion that even a partial realisation of these results would enable the natural colouring matter to compete successfully with its chemical rival. R. MELDOLA.

THE DUBLIN MEETING OF THE BRITISH ASSOCIATION.

ALL indications point to a successful meeting in Dublin this year for the British Association. The number of visitors already announced renders it very probable that the attendance will largely exceed that at the last Dublin meeting in 1878, and will compare favourably with many of the more recent meetings.

The list of papers to be read is practically complete, and the time allotted to scientific proceedings will be fully occupied, as will be seen from the provisional programmes of the sections given below. In Irish circles great interest is displayed in the discussion on the working of the Land Acts and the relation of railways to the State, problems on which the average Irishman is rather more of an expert than the ordinary citizen. That Sir Horace Plunkett will preside at the agricultural subsection, which deals with cooperation and allied matters, is a happy touch. Sir Horace founded, in 1896, the Recess Committee of Irish Parliamentarians, a non-political body convened for the purpose of gaining information with regard to the best methods of cooperative agriculture carried on abroad. That body subsequently led to the foundation of the Irish Board of Agriculture and Technical Instruction, which took over the whole of the work of the Science and Art Department in Ireland and a number of new duties, with the immediate result of regaining for the Irish producer much of his pre-eminence in the butter and egg market. Sir Horace Plunkett was the first vice-president of the new board, and although Ireland was considered to be " boarded over " already to suffocation, the new office had no difficulty in making itself beneficially felt from end to end of the country.

A considerable number of manufacturing establishments will be open to the inspection of members who visit Dublin. Foremost among these is Guinness's great brewery at St. James's Gate, one of the largest works of the kind in the world. These works will be open daily from 11 to 3, but the special British Association day will be Thursday, September 3.

The Dublin Corporation will show its electric light works daily from 10 to 4. These are situated on the site of the old Pigeon House Fort, on the south wall of Dublin Harbour. They lie right out in the sea, in the centre of Dublin Bay, surrounded by the unsurpassable scenery of the Dublin coast. The generating station of the Dublin United Tramway Company at Ringsend is also well worth a visit as the first representative of the three-phase system of traction in the United Kingdom. Dublin has every reason to be proud of its tramways.

Small parties of twelve will be admitted to Perry's planing and saw mills in Camden Row. I understand that ladies will not be encouraged to visit these, on account of the dangers threatened by the machinery.

No such restriction applies to Atkinson's poplin factory in Thomas Court, where visitors will be welcomed on the Tuesday, Wednesday, and Thursday. Poplin is a peculiar mixture of silk and linen, which combines most of the advantages of both materials. Its manufacture was introduced into Dublin by the Huguenot refugees in the eighteenth century, and has flourished ever since. Irish poplin is always among the materials worn at the Royal and Viceregal courts on Irish occasions.

Among the other establishments to be visited are Peterson's pipe factory, Jacob's biscuit works, Power's distillery, Winstanley's boot works, the Alliance gas works, and the great railway works of the Great Southern and Western Railway at Inchicore.

The social gatherings are numerous and attractive, as befits the gay city on the Liffey. On Wednesday, September 2 (the opening day), the Lord Mayor and Lady Mayoress will be at home at the pretty Mansion House in Dawson Street from 3 to 6 p.m.

On Thursday, September 3, the Provost and senior fellows will give a garden party at Trinity College from 3.30 to 6.30 p.m. This will be followed at 8 p.m. by a conversazione at Leinster House, the spacious and historic home of the Royal Dublin Society in Kildare Street. Smaller receptions will be given on Friday, September 4, by the Dean of St. Patrick's at his deanery, by the Irish Astronomer Royal at Dunsink Observatory, and by Miss White at Alexandra College. On the same day, at 2.30, a special *matinée* performance of Irish plays will be given at the Abbey Theatre (the Irish national theatre) of Yeats's *Hour Glass* and *Riders to the Sea*, and Lady Gregory's comedy *Spreading the News*. These should prove particularly enjoyable to those who look for a refreshing native atmosphere.

Saturday will be largely devoted to excursions, but a smaller conversazione will be given in the evening by the Classical Association of Ireland in the hall of the Royal College of Physicians.

For Sunday, September 6, special services will be arranged in various churches, and a special sacred concert, open to all members, will be given at the

Kingstown Pavilion, by special arrangement with Messrs. Adeler and Sutton.

The remaining days will be filled as follows:—Monday, September 7, 3.30 p.m., garden party at St. Anne's, Clontarf, given by Lord and Lady Ardilaun; Tuesday, 3.30, garden party at the Zoological Gardens, given by the local committee. At 8.30 p.m., reception by Viscount and Viscountess Iveagh at 80 St. Stephen's Green. Both Lord Iveagh and Lord Ardilaun belong to the Guinness family.

Wednesday, September 9 (closing day), garden party by their Excellencies the Lord Lieutenant and the Countess of Aberdeen at the Viceregal Lodge, Phœnix Park.

The excursion programme for Saturday, September 5, provides for six different routes. Perhaps the best of these is the excursion to Mellifont Abbey and the prehistoric tumuli of Dowth and Newgrange on the Boyne, passing on the way through Monasterboice and Drogheda. It leaves Amiens Street at 9.15 a.m., inclusive fare, 12*s.* Route B leads by Rathnew through the wild Devil's Glen to Glendalough, an old monastic retreat situated among the grandest scenery of County Wicklow. It leaves Harcourt Street 10 a.m., inclusive fare, 11*s.* 6*d.* Route C proceeds south-west to visit Killaloe, its cathedral, and (by steamer) Holy Island, on Lough Derg. It leaves Kingsbridge at 9 a.m., inclusive fare, 13*s.* 6*d.* Route D comprises Athlone, the "lordly Shannon," and the ancient and picturesque ecclesiastical ruins of Clonmacnois, where St. Kieran founded an abbey as early as A.D. 548. It leaves Broadstone station at 9 a.m., inclusive fare, 13*s.* 6*d.* Route E leads to Bray, the Dargle Glen, and to Powerscourt Waterfall, ending with a reception by the Earl and Countess of Meath at Kilruddery at 3.30 p.m. Route F leads south to the historic Rock of Cashel, Holycross Abbey, and Thurles. It leaves Kingsbridge at 9 a.m., inclusive fare, 13*s.*

Among the foreign invited guests of the British Association the following have accepted to date:—John Graham Brooks, Moritz J. Bonn (Munich), Prof. J. W. Brühl (Heidelberg), Prof. Ernst Francke (Berlin), Prof. Gustave Gilson (Louvain), Prof. A. A. Hubrecht (Utrecht), Prof. E. J. James (Illinois), C. W. Rubensen (Christiania), Prof. A. L. Rotch (of the Blue Hill Meteorological Observatory), Prof. Lotsy (Leyden), Haakon Schetelig (Bergen Museum), Prof. Achille Russo (Catania), M. Teisserenc de Bort (Paris), Prof. A. Kossel (Heidelberg), and W. Vernadsky (St. Petersburg).

A novel feature will be the intersectional telephone service, whereby a list of papers being read at each section will be on view at every section. This will be organised by means of a special telephone service worked by a staff of more than thirty operators. Communication between the various sections will be facilitated by a special tram service connecting all the sections, and also by a service of motor cars kindly placed at the disposal of the local committee.

The funds locally required have been subscribed without any very special effort, and a large amount of hospitality is being offered. E. E. FOURNIER.

PROVISIONAL PROGRAMMES OF SECTIONS.

SECTION B (CHEMISTRY).—A leading feature in this year's programme are discussions arranged with the object of focussing as clearly as possible the present state of knowledge and opinion. The subjects selected are:—Fermentation; the nature of chemical change; peat; and colloids. In the first, Dr. Harden, Prof. A. J. Brown, Dr. Slator, Dr. E. F. Armstrong, and others are taking part. The subject of chemical change will be introduced by Prof. H. E. Armstrong, and his views should provoke a lively opposition on the part of the upholders of the ionic theory. Peat has been selected as likely to arouse local interest; those contributing include Dr. Wohltereck, Capt. Sankey, Prof. Ryan, Prof. Johnson, Prof. Lyon, Dr. Adeney, Mr. K. B. Eller, and others. Prof. Procter will present a report on the present position of the chemistry of the colloids, and Dr. Findlay promises a paper in this subject. Sir Wm. Ramsay, K.C.B., is contributing a popular account of his recent researches entitled "The Inactive Gases," in which these and the emanations will be dealt with in respect to the periodic table. Prof. W. H. Perkin will describe synthetical experiments in the terpene series, and other papers from his laboratory are promised by Messrs. C. Weizmann and R. Robinson. Further papers in organic chemistry will be contributed by Prof. F. S. Kipping—optically active silicon compounds—Dr. F. D. Chattaway, and Mr. M. Nierenstein. Prof. Pope and Mr. Barlow will deal with valency, a subject which provoked so much discussion last year. Other papers include:—The properties of oxygen; and the curriculum in chemistry, Prof. H. E. Armstrong; the selective permeability of the coverings of certain seeds, Prof. A. J. Brown; rapid electrolysis, Dr. Sand; mercerisation, Dr. Hübner.

SECTION C (GEOLOGY).—Great interest centres in the address of the president, Prof. J. Joly, F.R.S., who will deal with the question of radium and geology. At the Leicester meeting Prof. Joly gave a foretaste of the widespread effects which radium may exercise on geological problems, and in the hands of one who is at once a high authority on physics as well as geology we may look for important and stimulating results. After the president's address, Prof. Cole will give a popular lecture on the general geology of the Dublin district, and a series of excursions arranged by Mr. H. J. Seymour will enable members to gain a practical knowledge of the district. Other papers dealing with local geology will be given by Prof. Cole (1) on probable Cretaceous outliers off the coast of co. Kerry, (2) on the laterite and bauxite zone of north-east Ireland. Mr. H. Bolton will describe a section of the emerald pit at Dungannon, and an important contribution by Messrs. R. J. Ussher, H. J. Seymour, E. T. Newton, and Dr. R. F. Scharff will throw new light on the question of the age of some caves in Castle Park, near Doneraile. Petrology will be represented by papers by Dr. F. W. Hume on the petrography of Egypt, Prof. Joly will record the occurrence of native iron in the Deccan basalts, Mr. W. G. Fearnsides will describe the tourmaline rocks of Cwm Dwthwc, near Llanberis, and Mr. H. Brodrick will give an account of the formation of cave pearls. Palæontology does not promise to occupy an undue amount of time, but the announcement by Mr. H. Brodrick of the occurrence of reptilian footprints in the inferior oolite of Whitby, and the report on the fauna and flora of the Trias, will no doubt arouse some interest. In general geology, Prof. W. M. Davis, of Harvard, will give a new rendering of the glacial erosion which has taken place in the Snowdonian district. Dr. Tempest Anderson will describe the changes which have taken place in St. Vincent since the great eruption, and Dr. Woolacott will give an account of a case of thrust and crush brecciation in the magnesian limestone of co. Durham. A discussion on mountain building has been arranged, and it is expected that some of our foremost geologists will take part. *Habitués* of Section C always look forward to an address by Prof. J. Milne, and his contribution on the duration and direction of large earthquakes will be as suggestive and inspiring as any in the past. Besides the papers mentioned above, the results of the various research committees will be presented to the meeting.

SECTION D (ZOOLOGY).—Dr. S. F. Harmer, F.R.S., in his presidential address, will deal with polyzoa. *Discussions*:—(i) On the abuses resulting from the strict application of the rule of priority in zoological nomenclature, and on the means of protecting well-established names, opened by Mr. G. A. Boulenger, F.R.S.; probable speakers: the president, Dr. Smith Woodward, F.R.S., Dr. Hoyle (Manchester), and others. (ii) Determination of sex, opened by Mr. Doncaster; probable speakers: Prof. Bateson, F.R.S., Mr. Punnett, Mr. Walter Heape, F.R.S., Prof. Russo (University of Catania), jointly with Section K; afternoon lecture (lantern): Some points in the evolution of fishes, Dr. Smith Woodward, F.R.S. *Papers:* Wild ancestors of the domestic horse, Prof. Cossar Ewart, F.R.S.; gastrulation of Amphioxus, Prof. MacBride, F.R.S. (Montreal); Arctic and Antarctic Collembola, Prof. Carpenter; reciprocal mimicry or diaposematism, Dr, F. A. Dixey; migrations of wading birds, Prof. C. J. Patten; lantern demonstration of the segmentation of marsupial ova, Prof. J. P. Hill; an inquiry into the feeding habits of birds, Mr. Gordon Hewitt; some points connected with the vertebrate alimentary canal, Prof. Alex. Fraser; nerve cells and giant nerve fibres in worms, Dr. Ashworth; vascular system in Stylodrilus, Mr. R. Southern; (α) maxilla and palatine in mammalia, (β) epiphyses in reptilia, Prof. R. J. Anderson; distribution of Irish fresh-water mites, Mr. Halbert. Monday, September 7, will be devoted to a joint session with Section I.

SECTION E (GEOGRAPHY).—The president (Major E. H. Hills, C.M.G.), will give an address on the survey of the British Empire; Prof. W. M. Davis, of Harvard, will read a paper on the physiographic subdivisions of the Appalachian mountain system, and their effects upon settlement and history; the Rev. W. Spottswood Green will discuss certain effects of geographical conditions in Ireland; Prof. R. A. Gregory will discuss school geography as a mental discipline, and Prof. J. L. Myres will give a paper on the geographical study of Mediterranean man in connection with classical education; Mr. W. L. Grant, of Oxford University, will lecture on geographical conditions affecting the northward development of Canada, in especial view of the visit of the Association next year to Winnipeg; Capt. F. V. Thompson and Mr. E. A. Reeves will exhibit and demonstrate surveying instruments designed by them; Capt. Thompson's work has been directed towards the development of stereophotographic surveying; Mr. H. G. Fordham will discuss and illustrate early county maps of England and Wales; Capt. H. G. Lyons will lecture on the longitudinal section of the river Nile; Mr. L. G. Bernacchi will give some results of a visit to Peru, and the Rev. S. Furlong will describe and illustrate volcanic phenomena in Samoa; Mr. Harold Brodrick will give results of his explorations, with illustrations, in the Marble Arch caves in the county Fermanagh, and Dr. Charles A. Hill will similarly describe the Mitchelstown caves in the county Tipperary.

SUBSECTION F (AGRICULTURE).—*September* 3: Presidential address, Sir Horace Plunkett; agricultural education, Prof. J. R. Campbell; some Irish experiments on warble flies, Prof. G. H. Carpenter; Barley growing and selection in Ireland, Herbert Hunter; electricity in agriculture, Sir Oliver Lodge, F.R.S. *September* 4: Discussion on breeding and the relation of modern theories of heredity to the problems of the stock-raiser, opened by Prof. W. Bateson, F.R.S., followed by Prof. T. B. Wood, Mr. W. Heape, Mr. R. C. Punnett, Dr. J. F. A. Marshall, and Prof. James Wilson. *September* 7: Discussion on small holdings—some considerations on their successful establishment," opener, Mrs. Wilkins. *September* 8: Joint meeting with the economics section: psychological aspects of agrarian reform, Dr. Moritz J. Bonn; the increase in the productivity of English agriculturists during the last two centuries, Prof. James Wilson; statistical and economic investigation in agriculture, W. G. S. Adams.

SECTION G (ENGINEERING).—*September* 3: Address by the president of the section, Mr. Dugald Clerk, F.R.S. *September* 4: Report of the committee on gas explosions, to be followed by a discussion jointly with members of the physical and chemical sections. *September* 7: Recent advances in steam turbines, Mr. Gerald Stoney; producer gas, J. Emerson Dowson; suction gas producers, P. W. Robson; the utilisation of peat for making gas or charcoal, Capt. H. Riall Sankey, R.E. *September* 8: The laws of flight, F. W. Lanchester; on the causes of wear in motor vehicle machinery, F. H. Royce; on a fundamental error in the theory of power transmission by belts, W. Worby Beaumont; railless traction, F. Douglas Fox.

SECTION H (ANTHROPOLOGY).—The proceedings will include a number of communications of first importance. Prof. G. Elliot Smith will read a paper on the history of mummification in Egypt, and in a second communication—anthropological work in Egypt—will deal with the physical type of the Egyptians from the earliest discovered human remains to the present day. A paper by Mr. C. T. Currelly, on the sequence of Egyptian flint implements, is of special importance in reference to the question of the relation of the Stone age of Egypt to that of Asia and Europe. Mr. J. P. Droop will describe a Neolithic site in the valley of the Spercheos; Mr. Thompson, the important excavations in Sparta during the past season; while a communication by Prof. R. C. Bosanquet will deal with the Minoan settlements in eastern Crete. Local archæology finds a place in a discussion on the Iron age in Ireland, of which the nucleus will be formed by papers by Messrs. G. Coffey, Armstrong, and Prof. Scharff, the last-named dealing with the early history of the horse in Ireland. Among other archæological papers may be mentioned one by Dr. H. Schetelig, of the Bergen Museum, on sculptured stones in Norway and their relation to some British monuments; prehistoric archæology in Japan, by Mr. Gordon Munro; and reports on the excavations made at Avebury by the Stone Circles Committee, at Caerwent by Dr. T. Ashby, and on the work of the Liverpool Committee for Excavation and Research in Wales and the Marches. Papers on general ethnography and the history of religion include a communication by Dr. C. G. Seligmann embodying the results of his recent expedition among the Veddahs of Ceylon; on a collection of Dinka laws and customs, by Mr. E. S. Hartland; the wandering of a cult in India—the god of the flood, by Sir Richard Temple; and a paper dealing with the origin and customs of the Mahrattas and Rajputs, by Mr. W. Crooke. Papers in physical anthropology include, in addition to that by Prof. Elliot Smith already mentioned, an important communication by Prof. D. J. Cunningham on the supraorbital region of the Neanderthal race; a paper by Mr. J. Gray, in which an attempt is made to identify the builders of the British Megalithic monuments with the hyperbrachycephalic race, of which remains have been discovered in the north-east of Scotland; and a paper by Prof. A. Fraser on certain points connected with the human brain.

SECTION I (PHYSIOLOGY).—*September* 3: Address of president, Dr. J. S. Haldane, F.R.S.; report of committee on the metabolic balance sheet of the individual tissues; report of committee on the effect of climate upon health and disease; report of committee on the ductless glands. *September* 4: Discussion on mental and muscular fatigue, opened by Dr. W. MacDougall, followed by Prof. J. S. MacDonald, Prof. T. H. Milroy (colour fatigue), Mr. H. Sackville Lawson (some aspects of mental fatigue, measurements by æsthesiometer); report of committee on body metabolism in cancer; report of committee on the electrical phenomena and metabolism of arum spadices. *September* 7: Joint meeting with Section D. Papers promised for joint meeting: Bionomics of tsetse-flies, R. Newstead; cultures of amœba, Dr. J. W. Stephens; on the action of atoxyl and allied compounds *in vivo* and *in vitro*, Dr. M. Nierenstein; on the life-history of piroplasma canis, Dr. A. Breinl and Mr. Hindle; pharmacological treatment of trypanosomiasis, Prof. B. Moore; the action of acids and alkalies on the growth and division of animal and vegetable cells, Prof. B. Moore and Dr. H. E. Roaf; digestive enzymes of invertebrates, Dr. H. E. Roaf. *September* 8: Discussion on instruction of school teachers in physiology and hygiene, opened by Prof. C. S. Sherrington, F.R.S., followed by Prof. W. H. Thompson and Prof. F. Gotch, F.R.S. Other papers (dates not yet arranged): Localisation of the brain in lemurs, Prof. W. H. Wilson and Prof. G. Elliot Smith, F.R.S.; localisation of the human cerebral cortex and the nature of sulci, Prof. G. Elliot Smith, F.R.S.; the functions of salts in metabolism—a request for information, Prof. H. E. Armstrong, F.R.S.; the relationship of the fundic to the pyloric part of the stomach, Dr. E. P. Cathcart. Arrangements will be made for demonstrations in the physiological laboratory of Trinity College.

SECTION K (BOTANY).—The presidential address will deal with the manifestations of the fundamental quantitative laws of physical chemistry in the living organism. Physiological communications are expected from Prof. Dixon, of Dublin, on the ascent of water in wood; from Prof. Bose, of Calcutta, on the mechanical and electrical responses of plants (with demonstrations); and from several workers in the Cambridge botany school on researches connected with photosynthesis in green plants; an account will be given by Miss Harriette Chick, of the Lister Institute, of the important laws governing the rate of killing of bacteria, brought out by the scientific study of disinfection; and some consideration will be given to the application of these laws to higher types of plants; Mr. Balls, of Cairo, will contribute a novel theory of the mechanism of mitosis; Mr. A. G. Tansley will read a paper on the woodlands of southern England, giving an account of the work done under the auspices of the central committee for the survey of British vegetation, by which a natural classification of these woods has been arrived at. There will be a discussion on the origin of dicotyledons, and the section will also join in a discussion organised by Section D on the determination of sex in animals and plants. It is expected that various distinguished foreign biologists, Prof. Bateson, and other zoologists will take part. Prof. Keeble, of Reading, will deliver the semi-popular lecture, giving an account of his interesting researches on the symbiosis between unicellular algæ and the marine worm Convoluta.

Section L (Educational Science).—Meetings for discussions and the reading of papers will be held in the mornings only. Visits have been arranged to selected schools on four afternoons. *September* 3: Presidential address, Prof. L. C. Miall, F.R.S.; the outlook: a grand experiment in education, Prof. H. E. Armstrong, F.R.S.; education under local authorities, Mr. R. Blair; schools for defective children, Mrs. Burgwin. *September* 4: Discussion on education in relation to rural life; openers, Prof. L. C. Miall, F.R.S., Prof. D. Houston, Miss Lilian J. Clarke, the Most Rev. Dr. Foley, Dr. W. J. M. Starkie, Mr. George Fletcher, and Mr. C. H. Bothamley. Practical studies in elementary schools: report of subcommittee on experimental science studies, Mr. W. M. Heller. *September* 7: Discussion on tests of educational efficiency (examination and inspection), openers, Mr. T. P. Gill and Dr. C. W. Kimmins; discussion on training in teaching, openers, Miss C. P. Tremain and Mr. C. Macgregor; open discussion on (1) note-taking and reports on work, (2) clear speaking and reading aloud, (3) motive and purpose in experimental work. *September* 8: Discussion on types of education and their relative values, openers, Dr. G. Archdall Reid and Prof. E. P. Culverwell; discussion on experimental inquiry in education, openers, Prof. J. J. Findlay (with Mr. P. Sandiford) and Prof. J. A. Green; curricula of secondary schools: report of subcommittee on the sequence of science subjects, Mr. G. F. Daniell.

LORD BLYTHSWOOD, F.R.S.

THE number of great territorial magnates who take a practical interest in science is no doubt larger than appears at first sight, but it is nevertheless regrettably small. Many of our landed gentry are unfitted by inclination and temperament to play any part in the game of politics, and their education, though it has not been without a certain valuable influence on character, has not, as a rule, been such as to encourage and develop that healthy and keen interest in natural things which is shown by almost all boys at an early age. Thus too many men, who have been placed by fortune above the necessity of earning their living in business or in the professions, are driven to spend their days in sport of one kind or another from year's end to year's end. At the best they lead a life, healthy it may be in a physical sense, but productive of no particular good to the community or the world at large, and detrimental to the strong plea which can be put forward for the existence of a leisured and broadly cultured class.

Happily there are and have been notable exceptions, and among these the late Sir Archibald Campbell, Lord Blythswood, must be accorded a high place. Born in 1835, the son of Archibald Campbell of Blythswood, he was of direct descent from the old Douglases who played such a prominent part in the English and Scottish wars of the thirteenth and fourteenth centuries, and was a member of the semi-regal family of the Campbells, who, whatever faults and foibles may have been rightly or wrongly attributed to them, have been conspicuous in the Scottish struggle for civil and religious freedom. In early life he was, as befitted such an ancestry, both soldier and politician. He saw active service with the Scots Guards in the Crimea, where he was severely wounded, and continued in the army until the death of his father in 1868. He then retired with the rank of lieutenant-colonel, to devote himself during the remainder of his life to work for the auxiliary forces, to politics (he was a keen Conservative), and to science.

He was married in 1864 to the elder sister of the present Lord Carrington, and held the offices of Lord Lieutenant of the County of Renfrew and of *aide-de-camp* to the late Queen Victoria. He sat in Parliament for West Renfrewshire from 1885 until 1892, when he was raised to the peerage as Baron Blythswood. He was elected to the Fellowship of the Royal Society in 1907. For some time Lord Blythswood had been in failing health, and the early part of the present summer was spent by him and Lady Blythswood in the south of France. On July 8 he died of heart failure at his seat of Blythswood, near Renfrew.

For a long time Lord and Lady Blythswood acted as hosts to members of the Royal family when they visited the west of Scotland for public functions; he entertained the King and Queen when—as Prince and Princess of Wales—they visited Glasgow to lay the foundation stone of the new university buildings at Gilmorehill in 1870, Queen Victoria when she opened the Glasgow Exhibition in 1888, and the Prince and Princess of Wales when they opened the new Natural Philosophy Institute and the new medical buildings of the university in April of last year.

But though Lord Blythswood had many interests, and devoted much time and attention to them all, his ruling passion was for physical science. He established at Blythswood a laboratory and workshop, which he equipped with the best instruments which could be procured for investigation, and with tools of the most refined description for the construction of apparatus and for the realisation of his own ideas regarding astronomical and physical machinery.

He employed skilled experimenters and mechanics to aid him in the work of construction and observation, and he obtained some notable results. He was a strenuous worker with his own hands at the bench; indeed, one of the most striking exhibits of the Glasgow Exhibition of 1888 was some fine wheelwork (for a magnificent astronomical driving clock), which had been cut by him in an almost incredible number of hours of continuous work.

Lord Blythswood's earlier work was mainly constructional, and valuable service was rendered to science by the improvement of tools and processes which resulted. A very important instrument, his great dividing engine, is perhaps the most striking outcome of this part of his scientific activity. As it now stands, this instrument is capable of ruling diffraction gratings with very great accuracy to as many as 14,400 lines to the inch, and many gratings of excellent optical quality have been made with it; but it has taken twenty-five years of modification and improvement to bring it to its present state. By a carefully designed and ingenious motion the diamond point is brought very gradually into contact with the surface to be ruled, so that disaster from its breaking is entirely avoided. Surely the skill and patience required for such work is as well deserving of recog-